

Soil Notes / Presentation and Lab,  
Section 3.3 page 97-99



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Soil Formation

- A thin layer of soil, rarely more than 2 m thick and often much thinner provides nutrients for ALL plants that grow on land.
- Soil is formed by bed rock or parent material which moves to the surface of the earth and is weathered by wind, rain and snow. *skin for the earth. acid rain*
- Decomposition of organic plant matter mixing with the small weathered particles create layers or horizons within soil.
- Surface water accumulates above ground and ground water percolates down below the surface. Percolation contributes to leaching of minerals away from the surface. *Al Fe.*
- Soil formation can be dependant on the type of forest mixed, deciduous or coniferous. *fir, cedar, spruce.*
- It is a continual process that can last hundreds or thousands of years. *maple, birch, elm ash, beech*

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Soil Samples

Soil samples are taken to determine the soil types in an area.

Several samples will be taken over a number of years to:

- Monitor changes in soil quality
- Assist in city planning for development and housing
- Plan for highway construction
- Plan for tree plantations and land reclamation.



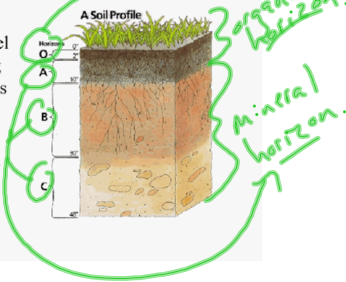
*after mining (oil sands operations)*

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Soil Horizons

A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil forming processes.

Used to classify the soil and make interpretations.



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Soil Profiles / Horizons

- Organic Horizons consists of :
- Litter – L is identifiable plant material
  - Fermenting – F is partially identifiable plant material
  - Humus – H is dark brown/black non identifiable plant material, completely decomposed.
- Mineral Horizons consist of varying levels of leaching with identifiable changes in color, depth, texture, structure and root consistency. Leaching of dissolved aluminum and iron cause color variations. Orange – Brown – Grey
- Ribbon Test helps determine the sand vs. clay content.
- A horizon - Transition from Organic
  - B horizon – Orange to brown colors
  - C horizon - Beginning of Parent Material (Bed Rock)



*3 horizons within*

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## Lab

You will visit a sample soil pit and fill out the following Soil Profile Descriptions for your site. Envirothon Students will facilitate the lab.

- Canopy and cover – Forest type
- Slope / Site location / Exposure
- Horizons, Organic L -F-H and Mineral A-B-C
- Depth for each horizon measured in cm
- Texture - sand vs. clay content – ribbon test and included descriptions
- Soil Structure – distinct size, shape and consistency
- Root Quantity – size, shape and number
- Color smears for each horizon
- Site sketches
  - a. horizons
  - b. Location

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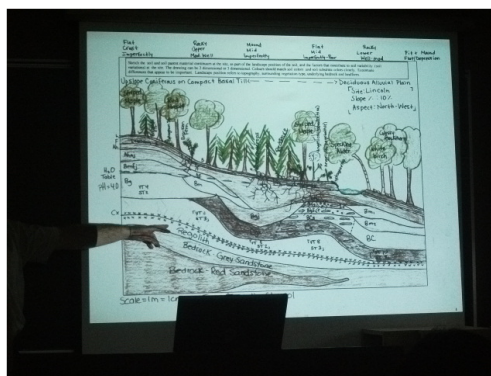
## Lab cont.

Procedure – visit the soil pit and complete the above activities, fill out the profile description field lab report and pass in your work.

Knowledge –

- Be able to identify the horizons for a soil sample
- Follow the proper procedures for creating a soil sample
- Properly complete a ribbon test and determine the sand vs. clay content of soil
- Properly complete the field report

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## Work

Read pages 97-99

Answer Understanding Questions 1-6

Review the Field report sheet and be prepared to go outside for the lab. You will get dirty.

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